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#CiscoLiveAPJC



AI-Powered Scripting with GitHub Copilot

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DEVNET-2159



#CiscoLiveAPJC

Cisco Webex App

Questions?

Use Cisco Webex App to chat with the speaker after the session

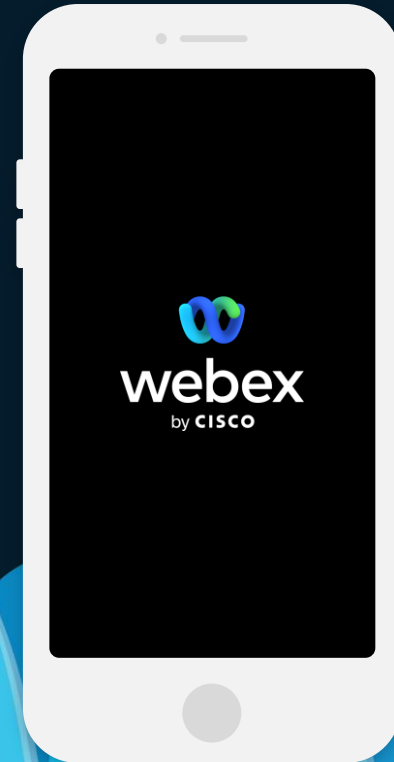
How

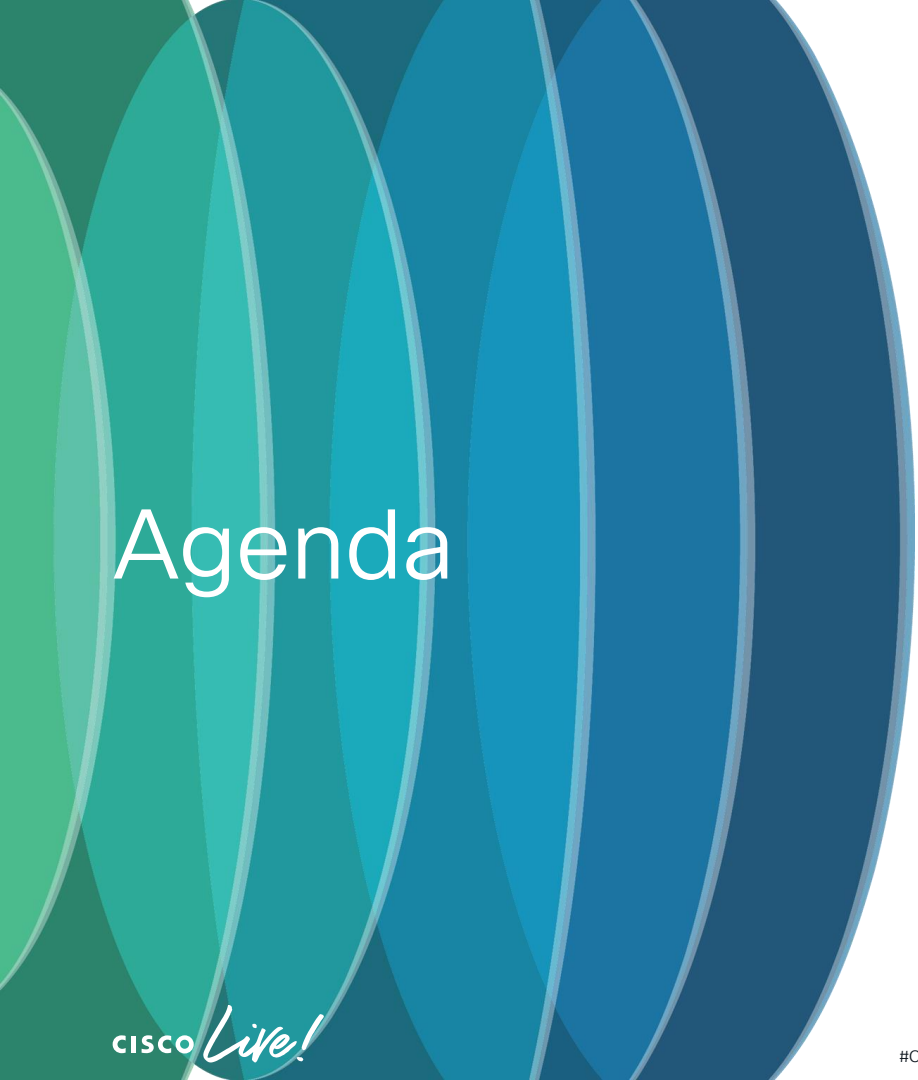
- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until November 15, 2024.



<https://ciscolive.ciscoevents.com/ciscolivebot/#DEVNET-2159>





Agenda

- Intro to Coding Assistants
- Getting Started: GitHub Copilot
- Scripting Use Cases & Workflows
- Effectiveness of Copilot
- Caveats

Coding Assistants
**improve developer
productivity**
using GenAI.



There is GenAI, and there is GenAI tooling.

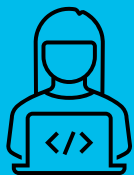
You don't need to "know AI" to use an AI tool!

You need to know **how to use the tool**, which includes knowing **how to create effective prompts**.

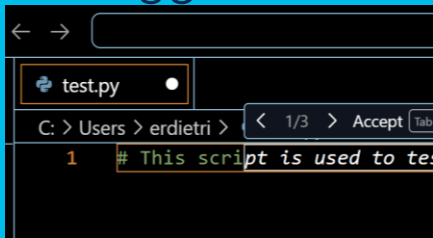
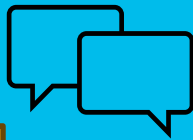
Getting Started: GitHub Copilot



The GitHub Copilot Suite

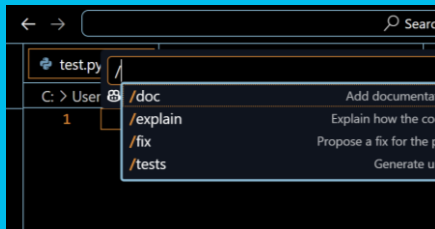
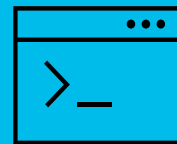


Copilot
Code
Suggestions



Companion to

Copilot Chat
Coding Help



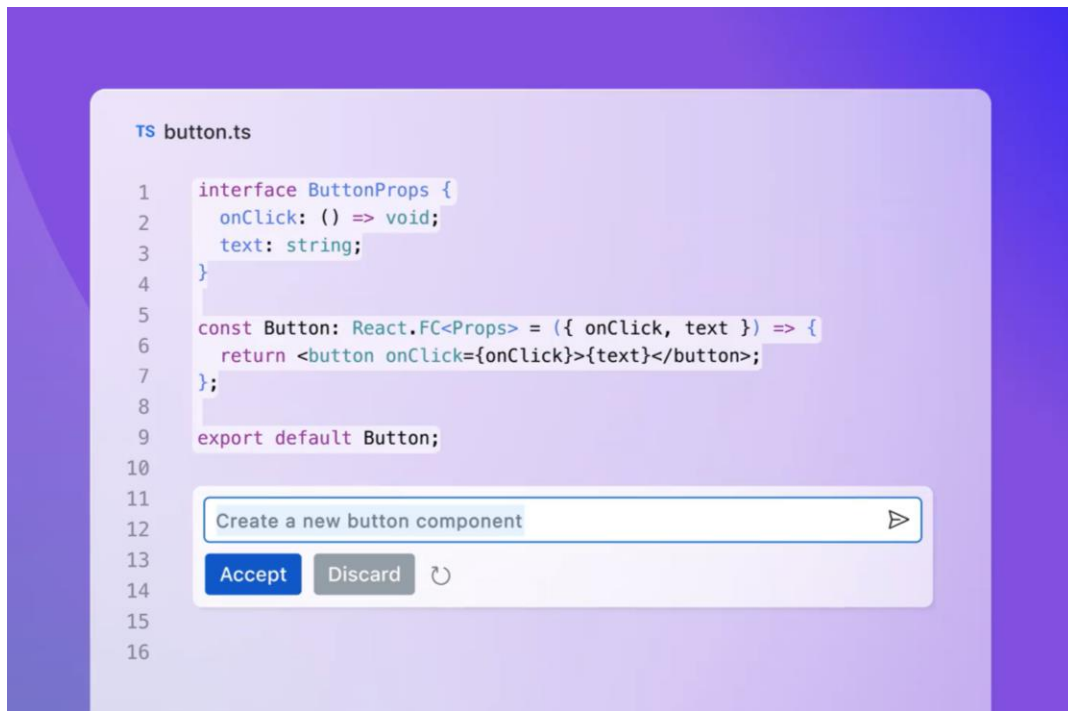
**Copilot in
the CLI**
Terminal Help

Core commands

- `gh auth`
- `gh browse`
- `gh codespace`

GitHub Copilot is the most widely used coding assistant in the world.

- Developed by GitHub and OpenAI in 2021
- Supports Python, JavaScript, TypeScript, Ruby, Go, C# and C++
- Developers are using it to **write code 55% faster**



"Why use Copilot when I can use ChatGPT?"

GitHub Copilot	ChatGPT
Specialised Purpose	General Purpose

"Why use Copilot when I can use ChatGPT?"

GitHub Copilot	ChatGPT
Specialised Purpose	General Purpose
More Accurate Code	Less Accurate Code

"Why use Copilot when I can use ChatGPT?"

GitHub Copilot	ChatGPT
Specialised Purpose	General Purpose
More Accurate Code	Less Accurate Code
More Contextual Awareness	Less Contextual Awareness

"Why use Copilot when I can use ChatGPT?"

GitHub Copilot	ChatGPT
Specialised Purpose	General Purpose
More Accurate Code	Less Accurate Code
More Contextual Awareness	Less Contextual Awareness
Can Include Internal Knowledge Base	Publicly Available Information Only

"Why use Copilot when I can use ChatGPT?"

	GitHub Copilot	ChatGPT
✓	Specialised Purpose	General Purpose
✓	More Accurate Code	Less Accurate Code
✓	More Contextual Awareness	Less Contextual Awareness
✓	Can Include Internal Knowledge Base	Publicly Available Information Only
	Subscription-Based	Free for v3.5
	More Technical	Familiar/Friendly Interface

How useful or reliable
is Copilot really?

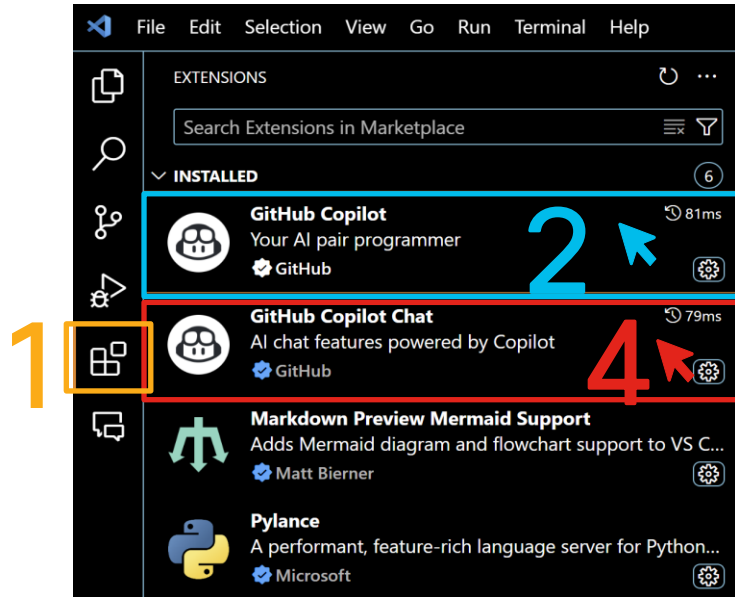
Prerequisites To Using GitHub Copilot

- Available as an IDE extension:
 - VS Code, Azure Data Studio, JetBrains IDEs, Vim, Neovim, Visual Studio
- Copilot Individual, Business, or Enterprise subscription

The screenshot displays the GitHub Copilot pricing page with three distinct subscription options, each with a description, price, and a call-to-action button.

Copilot Individual	Copilot Business	Copilot Enterprise
For individual developers, freelancers, students, and educators that want to code faster and happier.	For organizations ready to improve engineering velocity, code quality, and developer experience.	For companies looking to customize GitHub Copilot to their organization and infuse AI across the developer workflow.
\$ 10 USD per month / \$100 USD per year	\$ 19 USD per user / month	\$ 39 USD per user / month
Start a free trial >	Buy now > Contact sales >	Contact sales >
<small>Free for verified students, teachers, and maintainers of popular open source projects.</small>		

Install GitHub Copilot with Chat in VS Code 2022



3 Click Install button for Copilot
(shows Uninstall when already installed)



5 Click Install button for Copilot Chat
(shows Uninstall when already installed)

Using Copilot Inside VS Code

Click the "Chat" extension to ask questions. To use the Copilot prompt inline, press Ctrl+I or click the sparkle.

The screenshot shows the VS Code interface with the Explorer sidebar on the left. The Chat extension is highlighted with a blue box and a blue arrow pointing to it with the text "Start a chat". The main editor area shows a file named `demo_script.py` with a blue box around the first line containing the text "Press Ctrl+I to ask GitHub Copilot to do something. Start typing to dismiss." and a blue arrow pointing to it with the text "Press Ctrl+I to pull up Copilot". The bottom right corner shows a code editor with a file named `cisco_secure_access_auth.py` containing Python code. A blue box highlights a sparkle icon in the code editor, with a blue arrow pointing to it and the text "Click the sparkle to pull up Copilot".

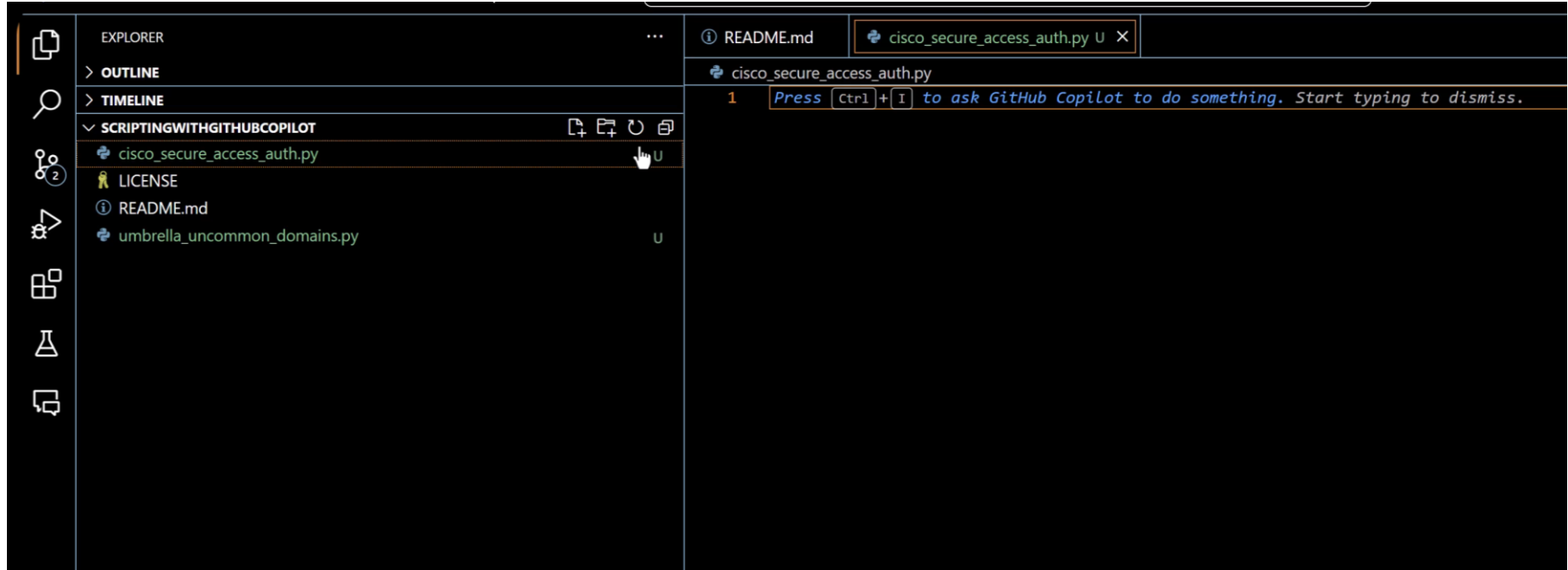
Start a chat

Press Ctrl+I to pull up Copilot

Click the sparkle to pull up Copilot

Scripting Use Cases with Copilot

Accept predictive code suggestions as you type.



Copilot can generate comments for code and predict the next comment based on context.

```
cisco_secure_access_reporting.py > ...  
1 import requests  
2 import json  
3 import requests  
4  
5  
6  
7 # Authenticate to the Cisco Secure Access Reporting API  
8 def authenticate():  
9  
10 url = "https://api.sse.cisco.com/auth/v2/token"  
11  
12 payload = None  
13  
14 headers = {  
15     "Content-Type": "application/x-www-form-urlencoded",  
16     "Accept": "application/json"  
17 }  
18  
19 response = requests.request('POST', url, headers=headers, data = payload)  
20  
21 print(response.text.encode('utf8'))  
22  
23 # Get the list of all the devices
```

A decently written comment can be enough for GitHub Copilot to suggest accurate code.

After using various files in a script, at the end of the script, I wanted to remove all unnecessary files.

Copilot correctly understood which files I would consider "unnecessary" based on context.

Original Comment

```
128  
129 # Clean up files used to determine uncommon domains.  
130
```

Accepted Code Suggestion

```
129 # Clean up files used to determine uncommon domains.  
130 def clean_up_files():  
131     os.remove('top-1m.csv.zip')  
132     os.remove('top-1m.csv')  
133     os.remove('top_destinations.csv')  
134     os.remove('top_1million_csv')
```

GitHub Copilot provides you with code options.

Original Comment

```
128
129 # Clean up files used to determine uncommon domains.
130
```

Option 1

```
128
129
130 def clean_up_files():
    os.remove('top-1m.csv.zip')
    os.remove('top-1m.csv')
    os.remove('top_1million_csv')
    os.remove('top_destinations.csv')
```

Option 2

```
128
129
130 def clean_up_files():
    os.remove('top-1m.csv.zip')
    os.remove('top-1m.csv')
    os.remove('top_1million_csv')
    os.remove('top_destinations.csv')
    print("Files have been cleaned up.")
131
```

Option 3

This alternative became unavailable to me while creating this example! Alternatives suggested often change.

Copilot can suggest better variable and function names.

Original Variable Name

```
7 # Authenticate to the Cisco Secure Access Reporting API and return the token
8 def authenticate():
9
10 url = "https://api.sse.cisco.com/auth/v2/token"
11
```

Suggested Variable Name

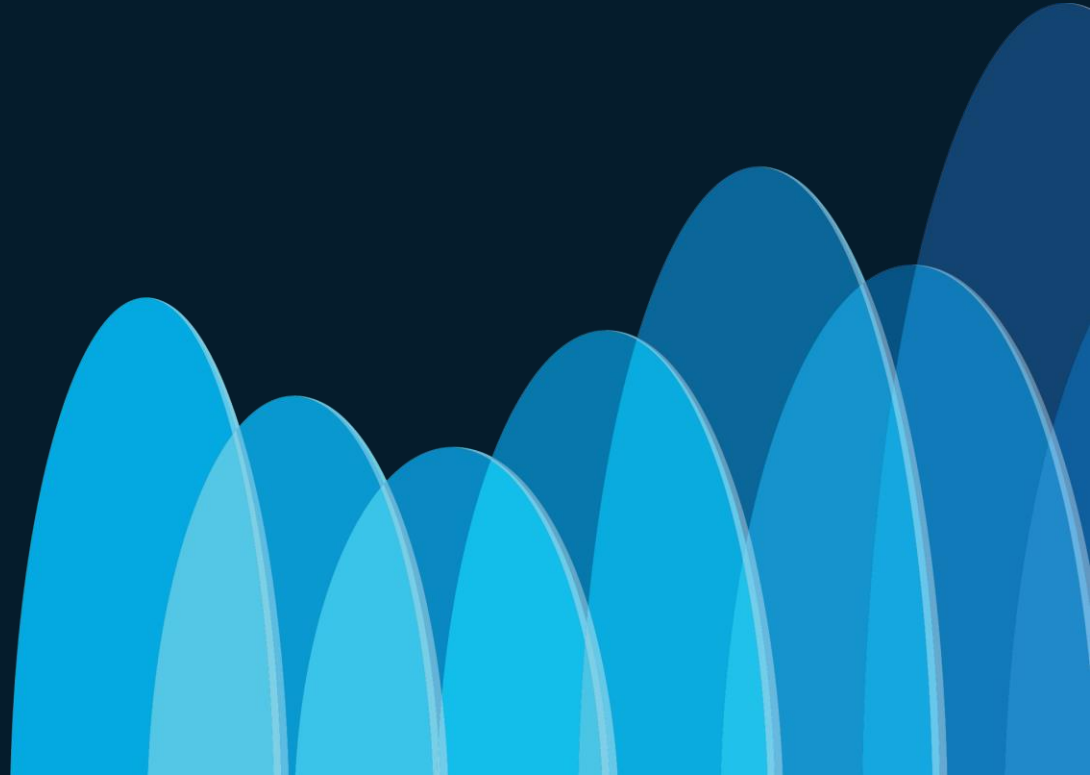


Get suggestions around code security.

U

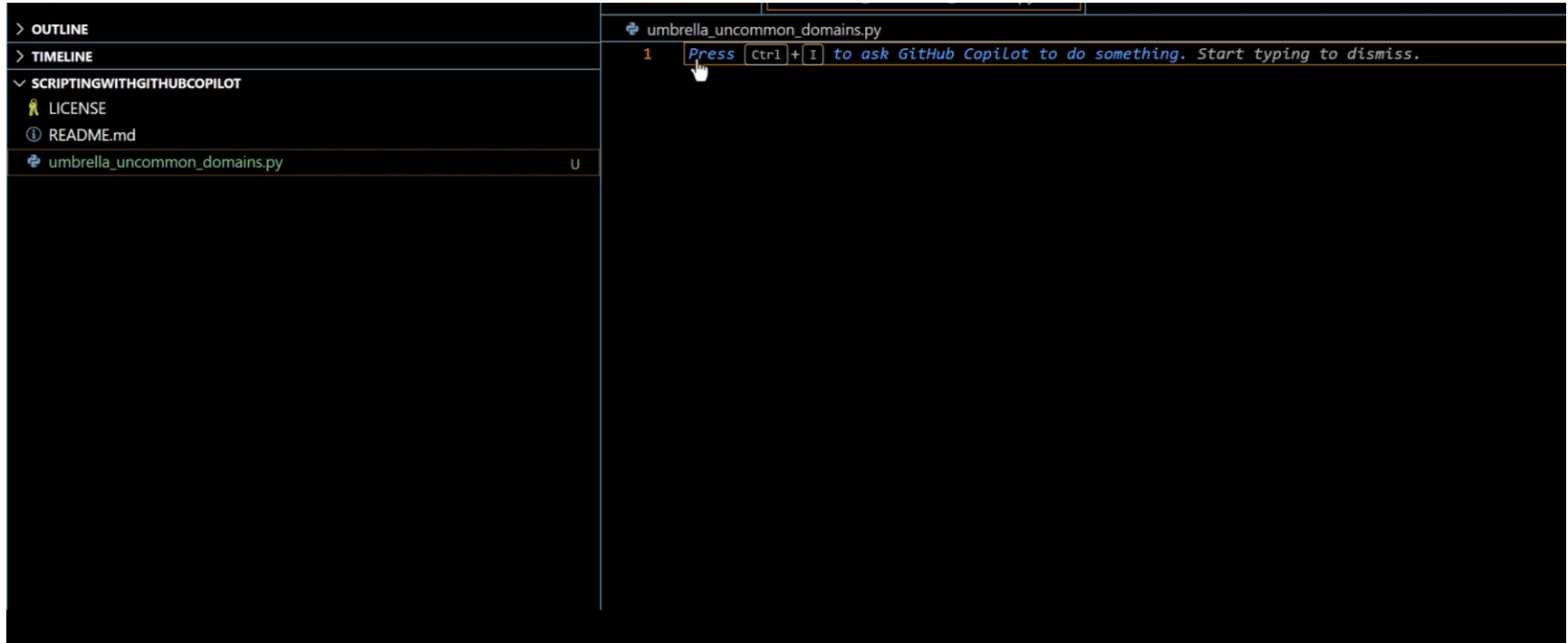
```
2 import requests
3 import json
4 import os
5 import pandas as pd
6 from dotenv import load_dotenv
7
8 load_dotenv()
9
10 # Set the Cisco Umbrella Investigate API key
11 api_key = 'fjdsklewoiafewiaefije'
12
13 ✨
14
15
```

Scripting Workflows with Copilot



Option 1: Copilot-Informed Scripting

Code as you normally would, but with Copilot enabled.

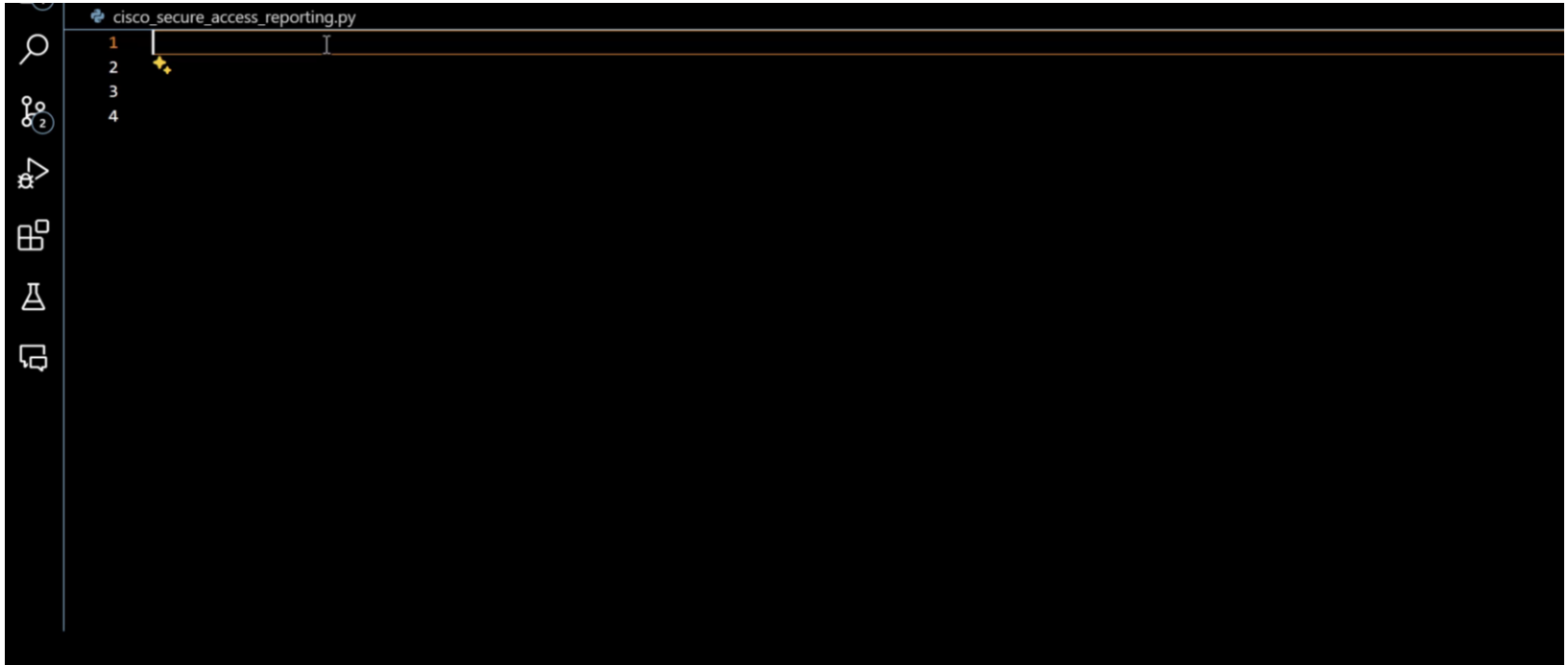


Ways To Be “Copilot-Informed”

- Accepting predictive text as convenient
- Asking Chat questions as needed
- Getting code security suggestions
- Getting refactoring suggestions
- Generating comments
- Generating code documentation

Option 2: Copilot-Driven Scripting

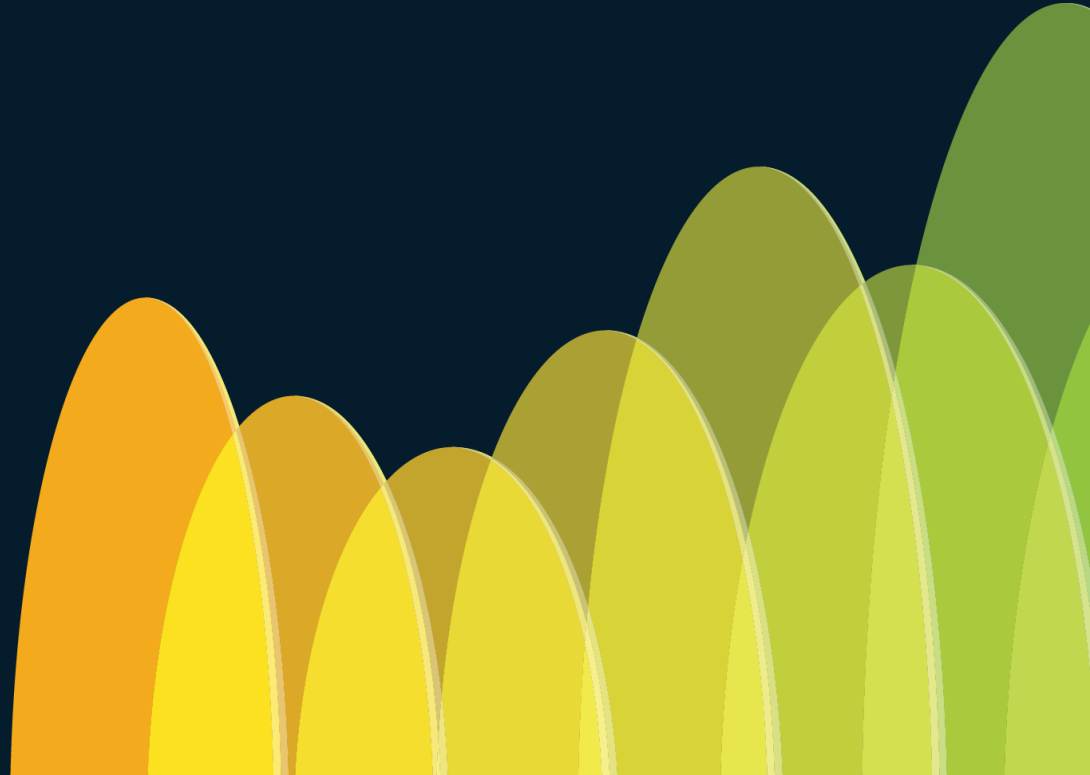
Generate code from descriptive comments ("effective prompts")



How To Be “Copilot-Driven”

- Generate code from descriptive comments ("effective prompts")
- Being "Copilot-driven" also requires...
 - Knowing how to implement suggested logic
 - Evaluation of all code generated
 - Willingness to make code changes where needed

Effectiveness of Copilot



How useful or reliable is Copilot **really**?

Highly reliable

- Variable naming
- Function naming
- Answering questions about libraries
- Teaching concepts

Moderately reliable

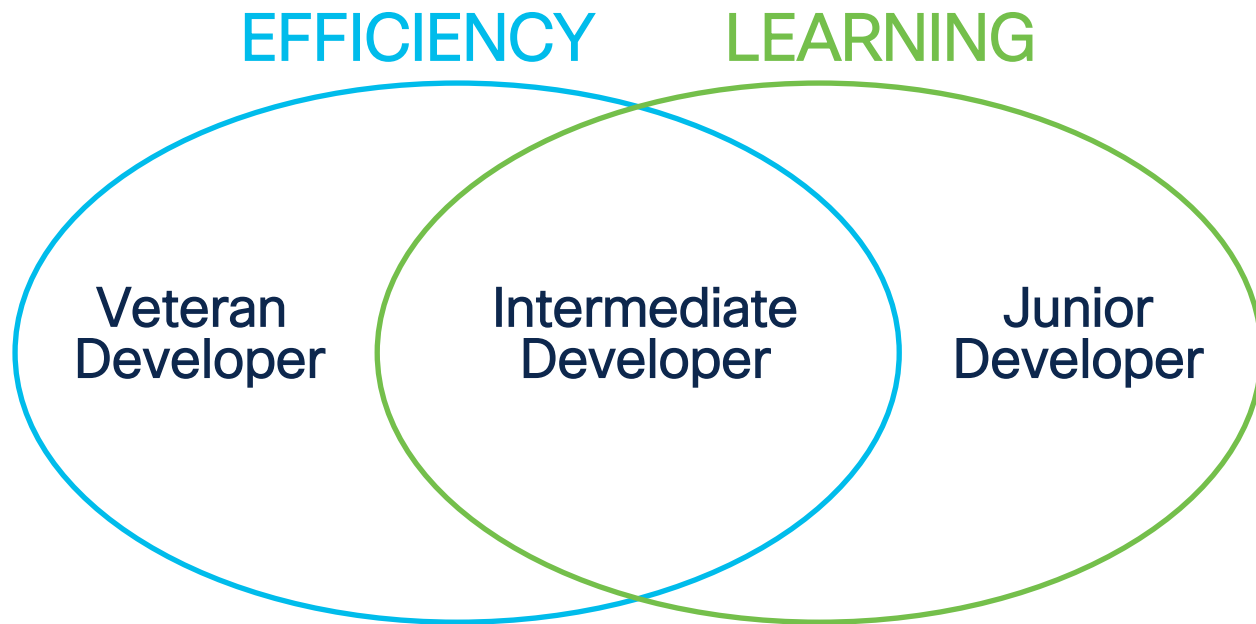
- Comment generation
- Code generation from comments
- Specific code generation
- Secure code suggestions

Not so reliable

- Code scaffolding
- API requests
- Complex code generation

The smaller and
more specific the task,
the more reliable Copilot is.

Where can Copilot **provide the most value** when scripting?



Caveats



Coding assistants
aren't always correct.

Faster code
doesn't equal
better code.

Coding assistants
are not a replacement
for knowing how to code.

Takeaway



How will **you** start using Copilot?

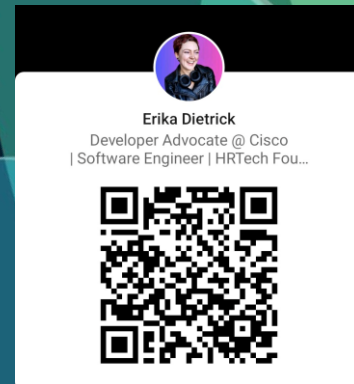


Thank you

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X, TikTok, Instagram:
@erika_thedev



“What is Copilot doing with my data?”

- Prompts are encrypted (in-transit and at rest) and transmitted to Azure, where Copilot’s model is hosted
- If using the Copilot extension, Copilot will discard your prompt, suggestion, and supporting context.
- GitHub doesn’t train on code from Business/Enterprise customers, but Individuals must opt-out

Keynote Deep Dives

Wednesday
10:30am – 11:30am



Experiences Amplified:
How AI Can Fuel Better Employee and Customer Experiences

Level 1
Room 106



Smart, Secure, Seamless:
Transforming Experiences with Next-Generation Networking

Level 2
Room 204



Harness a Bold New Era:
Transform Data Centre and Service Provider Connectivity

Level 2
Room 203



Securing User to Application and Everything in Between

Level 2
Melbourne Room 2



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Thank you

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